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SOME ASPECTS OF THE GENERAL OSTEO-ARTHRITIC PROBLEM IN THE HORSE*

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Chronic arthritis is probably the commonest crippling condition we meet with in the horse, and yet the power of repair, inherent in joints, is probably greater than in most other tissues.

Clinically, we recognise healed, or at least inactive disease by exostoses, when there is no loss of function. When, however, routine *post-mortem* examination of joints and bones is made it is extraordinary how common arthritis is. We find it in numerous joints throughout the body without any clinical signs ever having been noticed during life.

In one and the same horse we see in some joints active ulceration of articular surfaces, in other joints healed lesions recognised by nodular irregularities of the surface and patches of fibrous tissue replacing articular cartilage. These lesions may never have caused any disability.

Apparently depreciation in the structure of joints can advance far before any clinical sign of loss of function develops.

My appreciation of the immense amount of sub-clinical disease in the joints of the horse arose during an investigation of the condition "shivering." As it was before this Division I first showed a specimen of the lumbar region of the spine of the first horse I destroyed on account of "shivering," and at that time the only horse I had examined, it is perhaps fitting that I should come four years later and give you my more mature views.

At that time and so long as I simply examined old horses, I was under the impression that "shivering," the closely allied condition "jinked back"—I now prefer to call it partial paraplegia—and possibly also stringhalt, were due to encroachment of osteophytes on intervertebral foramina, compressing emerging nerve roots going to form the lumbo-sacral plexus of nerves. This idea I soon found to be untenable when I came to examine young horses affected with any of these conditions, but having first been attracted to the nervous conditions through osteo-arthritis of the vertebral column, I continued to look for signs of osteo-arthritis and made it a routine measure to open all the limb joints and as many of the joints of the vertebral column as possible. At the same time, a thorough examination of the whole body was made, and tissues, especially peripheral nerves, were taken for microscopic study.

In addition to the three original horses examined when my attention was fixed more particularly on the lumbar region, I have now examined eleven other "shiverers," many of them young horses, and the main *post-mortem* findings in these I have summarised in Table A.

Scrutiny of the Table will fix better in the mind the protean nature of the disease in horses primarily investigated because they showed the clinical sign "shivering," though from the column "Clinical Examination" you will see that there are often other clinical conditions occurring at the same time which might have been the primary reason for investigation.

In the same way, I have drawn up a table of the naked-eye lesions found in horses primarily destroyed on account of partial paraplegia ("jinked back"), Table B.

I might also have drawn up a table for miscellaneous cases, to include horses examined where such conditions as ringbone, navicular disease, stringhalt, sidebone were the primary reason for destruction, and the same variety of findings would be recorded as in Tables A and B (overleaf).

From the findings, as set out in table form, of these various horses, the chief distinction lies in the clinical examination, where the diagnosis of abnormal structure or function has led to various conditions having a legend attached to them, which in the past has served to elevate these conditions to the rank of specific diseases. From a diagnostic point of view, the labelling of conditions according to tradition will no doubt endure, but new prognostic values must be placed upon the various clinical conditions discovered, in view of the fact that in every horse showing one or other of these conditions, numerous occult lesions will be present. Thus, if we find a horse suffering from any of the conditions stated in the column "Clinical Examination" in either Tables A or B, we are justified in taking that sign as a pointer that that horse is suffering from a generalised disease, which, sooner or later, may be followed by the development of other clinical signs, and may finally render the horse useless for work.

Now of all the clinical signs associated with this generalised disease, those associated with

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Table A: Examination of Eleven Clydesdales suffering from "Shivering."

Sex.	Age in Years.	Clinical Examination.	Post-mortem Findings.		
			Joints affected.	*Bones affected.*	*Other changes.*
G	2	"Shivering" "Grunting"	Both coxo-femoral, femoro-tibial, and tibio-tarsal. Costo-vertebral (numerous).	Both femurs — osteitis shaft. Exostosis R. 2nd metatarsal (splint).	All lymphatic glands — hyperplastic. Oesophagus — fibrositis terminal portion. Larynx—intrinsic muscular atrophy left side. Both sciatic nerves—congested. Intestines—worms. Verminous aneurysm.
G	4½	"Shivering"	Right scapulo-humeral. Left coxo-femoral. Left femoro-tibial. Costo-vertebral (numerous). Lumbar intertransverse.	Ossified cartilages 3rd phalanges. Osteitis 3rd phalanges. Costal sulcus.	Right sciatic nerve—congested. Intestines—worms.
G	5	"Shivering" "Grunting" "Sidebones" "Bogspavins" Heart irregular	Both scapulo-humeral, humero-radial, humero-ulnar, coxo-femoral and tibio-tarsal. Right femoro-tibial. Costo-vertebral (numerous). Lumbar intertransverse.	Ossified cartilages 3rd phalanges. Osteitis 3rd phalanges. Phalangeal exostoses 1st and 3rd phalanges. Pelvis—exostoses. Atlas—exostoses. L and R 2nd metacarpals —exostoses.	All lymphatic glands — hyperplastic. Gastric ulcers. Both sciatic nerves—congested. Larynx—intrinsic muscular atrophy left side. Degeneration of ligaments in right coxo-femoral joint. Intestines—worms.
M	1½	"Shivering" "Grunting" General debility Fore fetlocks almost touch the ground "Bog spavins"	Both scapulo-humeral, humero-radial, humero-ulnar, radio-carpal, coxo-femoral and tibio-tarsal. Left femoro-tibial. Costo-vertebral (numerous). Lumbar intertransverse.	Portion of head of left femur semi-detached.	All lymphatic glands — congested. Gastric ulcers. Cystic ovary. Both sciatic nerves—congested. Larynx—intrinsic muscular atrophy left side, limited to vocal and ventricular muscles. Intestines—worms. Verminous aneurysm.
G	3½	"Shivering"	Both scapulo-humeral, metacarpo-phalangeal coxo-femoral, and femoro-tibial. Costo-vertebral (numerous). Lumbar intertransverse.	1st phalanges—exostoses. Osteitis 3rd phalanges.	All lymphatic glands — hyperplastic. Oesophagus—fibrositis terminal portion. Both sciatic nerves—congested.
M	3	"Shivering"	Both scapulo-humeral, humero-radial, humero-ulnar, and coxo-femoral. Right tibio-tarsal. Right metatarso-phalangeal.		
G	6	"Shivering" "Sidebones"	Costo-vertebral (numerous).	(Limb, bones and joints not examined).	All lymphatic glands — hyperplastic.
G	3½	"Shivering"	Both scapulo-humeral, coxo-femoral and tibio-tarsal. Costo-vertebral (numerous). Lumbar intertransverse.	Ossified cartilages 3rd phalanges. Osteitis 3rd phalanges. 1st phalanges—exostoses.	All lymphatic glands — hyperplastic.

Sex.	Age in Years.	Clinical Examination.	Post-mortem Findings.		
			Joints affected.	*Bones affected.*	*Other changes.*
M	2	" Shivering "	Both scapulo-humeral and coxo-femoral. Left tibio-tarsal. Costo-vertebral (numerous). Lumbar intertransverse.	Small metacarpals and metatarsals—exostoses. Osteitis 3rd phalanges.	All lymphatic glands—hyperplastic. 2 large chronic retro-pharyngeal abscesses. Gastric ulcers. Intestines—worms.
M	10	" Shivering " " Sidebones " " Ringbones " " Windgalls " Does not lie down.	Both scapulo-humeral, humero-radial, humero-ulnar, coxo-femoral, femoro-tibial and tibio-tarsal. All joints of feet. Costo-vertebral (numerous). Lumbar intertransverse.	Practically every bone in the body.	Oesophagus—fibrositis terminal portion. Gastric ulcer. Both sciatic and femoral nerves—congested. Cystic ovary. Intestines—worms.
G	3	" Shivering " " Grunting " Carpal exostosis (n.f.) Sandcracks both fore feet.	Both scapulo-humeral, coxo-femoral and femoro-tibial. Right humero-radial and humero-ulnar. Costo-vertebral (numerous). Lumbar intertransverse.	Small metacarpals and metatarsals—exostoses. Carpal bones.	All lymphatic glands—hyperplastic. Chronic pleurisy. 6 ozs. fluid in pericardium. Larynx—intrinsic muscular atrophy left side, limited to vocal and ventricular muscles. Left sciatic nerve—congested. Intestines—worms.

Table B: Examination of Five Horses suffering from Partial Paraplegia (" Jinked Back ").

Sex.	Age in Years.	Clinical Examination.	Post-mortem Findings.		
			Joints affected.	*Bones affected.*	*Other changes.*
Hunter G	13	Partial Paraplegia " Ringbone "	Both humero-radial, humero-ulnar Both coxo-femoral Costo-vertebral (numerous) Lumbar intertransverse	1st phalanges—exostoses 2nd phalanx O.F.—exostoses. Osteitis 3rd phalanges Osteitis sesamoid of 3rd phalanx (navicular disease) both fore.	Calcareous plaques wall of heart. (Right atrium). Verminous aneurysm. Slight perihepatitis.
Hunter G	5	Partial Paraplegia " Splints "	Both scapulo-humeral, humero-radial, humero-ulnar and radio-carpal. Right coxo-femoral, Both femoro-tibial. Costo-vertebral (numerous).	Splints right fore. Cervical vertebræ—exostoses.	Oesophagus—fibrositis terminal portion. Chronic pleurisy. 7 ozs. fluid in pericardium. Chronic peritonitis. Lymphatic glands—hyperplastic. Intestines—worms. Verminous aneurysm (slight). Left sciatic nerve—congested. Yellow effusion intermuscular fascia hind limbs.
Hunter M	12	Partial Paraplegia	Both scapulo-humeral, metacarpo - phalangeal and proximal interphalangeal. Costo-vertebral (slight changes). Cervical interarticular between 6th and 7th, also a loose body in joint.		Split 3rd upper cheek tooth. Oesophagus — fibrositis (slight). Chronic peritonitis (slight).

Sex.	Age in Years.	Clinical Examination.	Post-mortem Findings.		
			Joints affected.	*Bones affected.*	*Other changes.*
Thorough-bred G	1½	Partial Paraplegia	Both scapulo-humeral, humero-radial and humero-ulnar. Both coxo-femoral especially left. Both femoro-tibial. Costo-vertebral (numerous). Cervical interarticular.		Intestines—worms. Lymphatic glands—hyperplastic.
Thoroughbred	1	Partial Paraplegia	Left scapulo-humeral, Both humero-radial, humero-ulnar and coxo-femoral. Left femoro-patellar. Both tibio-tarsal. Left metatarso-phalangeal. Costo-vertebral (numerous). Lumbar intertransverse. Cervical interarticular (1 joint).	Navicular disease early.	Soft tissues not examined.

disturbance of the nervous system are regarded as the most to be dreaded and the most mysterious. At this stage, from consideration of the facts as given in Tables A and B, I think I can say that horses suffering from "shivering," partial paraplegia, grunting, and from a limited investigation, stringhalt, all have some degree of chronic arthritis, but arthritis alone is not sufficient to account for the loss of control over muscular movements.

I will now turn to the consideration of the neurological side of the problem.

Neurological Problems Associated with Chronic Arthritis

(*a*) Clinical Relationship of Shivering, Partial Paraplegia, Stringhalt and Grunting.

I must confess that there are cases which I find difficult to place in a definite category as far as the first three conditions are concerned. There are cases which appear to be combinations of these clinical conditions, *e.g.*, many cases of shivering show, every now and then in the course of movements through which an animal is put during examination, a spasmodic elevation of a hind limb, in other words, a definite stringhalt movement.

On the other hand, there are cases where stringhalt predominates and spasmodic elevation of the tail and tremor of muscles may only be seen at intervals. Similarly, the border line between shivering and partial paraplegia is often difficult to define. The gross case of partial paraplegia offers no difficulty in diagnosis where there is an unsteady gait behind, difficulty in turning, and inability to back; in bad cases the legs are often crossed, the feet are dragged during progression, and there is a constant fear of the horse falling. In many of these cases there are seen intermittent tremors of muscles about the quarters, difficulty in backing, and when there are slight swaying movements behind there is doubt into which category—shivering or partial paraplegia—the vague inco-ordination should go. Inco-ordination of movement in the fore legs may occur in both conditions. Shivering is generally regarded as unknown in the light horse; it is easier, therefore, to give a diagnosis of partial paraplegia in this class, but in heavy horses both shivering and partial paraplegia are recognised. Stringhalt, of course, is met with in all classes of animals.

When I come to consider the lesions found in nerves it will not be so surprising that definite diagnosis is sometimes difficult.

The relationship of grunting to this general disease is one which appears to me to be significant in view of the divergent opinions held regarding the importance of this sign in examining horses for soundness. Most, I think, will agree that there is a close relationship between shivering, partial paraplegia, and stringhalt, but many will probably wonder how grunting can be related to them.

In Table A you will see that four horses primarily destroyed on account of shivering were also diagnosed as grunters. In each case, a dissection was made of the larynx and some degree of atrophy of the intrinsic muscles on the left side was found, the intrinsic muscles affected being those supplied by the left recurrent laryngeal nerve. After discovering the first case I made it part of my routine to examine the larynx of all horses destroyed, and I have invariably found that horses which were not grunters showed no degeneration of laryngeal muscles.

The atrophy may be very limited, affecting only the slender ventricular and vocal muscles, or it may be extensive, all the muscles supplied by the left recurrent laryngeal nerve being markedly wasted. I was not able to test the grunters during life to see whether they were roarers, but from the examination of the larynx I imagine that minor degrees of atrophy of intrinsic muscles account for some horses not being roarers, there being merely enough loss of muscular power to cause a lag in the abduction of the vocal cords; hence the grunt when a horse is suddenly taken unawares on testing in the usual way.

These four cases have helped to strengthen a vague impression I formerly had that sooner or later a "grunter" is liable to "go wrong" either by becoming a roarer or by developing other dystrophies associated with the nervous system or various osteo-arthritic conditions about the limbs. If further evidence of laryngeal muscular atrophy can be obtained in all cases of horses known to be grunters during life the significance of grunting as a clinical sign would be beyond doubt.

(*b*) Macroscopic Lesions of Peripheral Nerves.

So that you may have a more complete idea of this problem as it has unfolded itself, I will repeat briefly some of the observations I have already made in previous papers.

It was the osteo-arthritic conditions affecting the vertebral column which first directed my attention to the lumbar region of the spine, and led to my suspecting that the clinical signs of shivering might be due to pressure upon nerve roots by encroachment of osteophytes at the intervertebral foramina. This suspicion appeared to be confirmed in the first three horses I examined, as there were very definite bony enlargements in the lumbar region, in one case practically obliterating an intervertebral foramen. It was not long before I realised that such encroachments on intervertebral foramina were often present in horses which were not shiverers, and that they could be found in any old horse with clinical osteo-arthritic lesions.

There was also found, in various nerve roots where there was no appearance of narrowing of the foramina, microscopic evidence of degenerative change such as I will describe later, thus discounting the effects of pressure as the only cause.

The fact that definite lesions were found in the roots of these early cases examined, resulted in greater attention being paid to the peripheral nerves in all subsequent examinations and you will see in Table A that in quite a number of cases very definite naked-eye evidence of congestion of nerve trunks has been observed. The commonest site for such congestion to be seen is in the sciatic nerve where it turns down behind the hip joint. One often finds here four or five inches of the nerve, swollen, pink in colour, with occasionally definite small hæmorrhages into its substance; the contrast with the white nerve trunk above and below such an area is well marked.

I have seen similar patches of congestion in roots of the lumbo-sacral plexus, the femoral, median and radial nerves, but not nearly so frequently as in the sciatic. Naturally it has been impossible to make a routine examination of all the peripheral nerves in the course of a *post-mortem* examination, where so much time has been spent investigating the many pathological changes in joints, but I have no doubt that many other nerves would have revealed similar changes.

(*c*) Microscopic Lesions in Peripheral Nerves.

After inspecting the chief nerve trunks of the limbs at a *post-mortem*, a routine microscopic examination has been made of portions of the sciatic, femoral, median, radial and ulnar nerves taken from both sides. In all shiverers and all cases of partial paraplegia the sciatic and femoral nerves, often on both sides, and less frequently one or more of the nerves from the fore limbs show definite pathological changes. The microscopic changes are often well marked even in cases where to the naked eye the nerve looks normal.

The sections of these nerves need to be seen to appreciate the amount of damage affecting them, but the photo-micrographs of transverse sections (exhibited) will serve to explain the changes better than a long descriptive account.

Briefly, the disease process is a definitely inflammatory one—a neuritis. Varying degrees of involvement of a nerve may occur; it may only be one or two bundles of fibres or practically all the bundles may suffer. Some bundles appear as if the individual nerve fibres have been isolated by a serous exudate instead of being closely packed together as in the normal. Actual hæmorrhage is seen in areas which showed petechial hæmorrhages to the naked eye.

The next stage in the inflammatory process is the development in patches in the nerve bundles of young fibroblasts, probably from the pre-existing endoneurium lying between the nerve fibres. This overgrowth of fibroblasts leads to disappearance of the nerve fibres. Later the young fibroblasts develop into a felted mass of fibrils containing very few nuclei, in some places remaining in elongated strands and in others it takes a whorl-like form. A peculiar thing is that all the nerve fibres in a bundle never seem to disappear, though in bad cases of shivering and partial paraplegia the proportion of nerve fibres left in nerves such as the sciatic and femoral is very small.

From naked-eye and microscopic examination

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definite structural damage of numerous peripheral nerves has been seen in every horse detailed in Tables A and B, with the exception of one in Table B where the skeleton only was examined. There has also been a neuritis found in the recurrent laryngeal nerve of one of the horses which was a grunter, but beyond this case no work has so far been carried out to locate peripheral nerve lesions in the case of grunters.

Now, structural damage as revealed by pathological methods is by itself a most unsatisfactory thing, but when we can co-relate the damage with definite functional disturbances during life we begin to approach a truer understanding of disease. We recognise the conditions shivering, stringhalt, partial paraplegia and grunting (on the strength of four cases) because they translate themselves in the form of disturbance of the functions of muscles and the control of these muscles is effected by the nervous system.

There appears, however, to be a grading of nerve derangement, as considerable damage to the peripheral nervous system can occur without producing recognisable clinical signs. This further example of sub-clinical disease was learned by taking a length of sciatic nerve from the region just behind the hip joint from 13 horses, showing no clinical signs of muscular dystrophy. In six cases, a picture of chronic neuritis closely resembling that seen in horses affected with shivering was found.

The fact that all the nerve fibres in any bundle do not appear to be destroyed makes it very difficult to state what proportion of nerve fibres can be obliterated without producing clinical signs of interference with muscle control.

The gross damage which is seen in the sciatic, femoral and often a number of the nerve roots of the lumbo-sacral plexus in horses which show clinical signs of shivering and partial paraplegia appears to be quite sufficient to account for the disturbance of the smooth working of the agonist and antagonist muscles without any damage of the central nervous system being necessary.

Depreciation of cellular function is the foundation upon which disease is built, and I believe that the various gross manifestations of damage to the peripheral nervous system in the form of a neuritis is the underlying reason for the manifestation of the clinical signs we call shivering, stringhalt, partial paraplegia and grunting.

THE COMMON FACTOR IN OSTEO-ARTHRITIS AND ALLIED CONDITIONS

The more I see of *post-mortem* and clinical examinations of the horse the more impressed I am with the infinite pathological states found in the various tissues of the body which have a common factor in their production.

No matter whether the pathological changes be in joints, bones, nerves or heart muscle, all the changes can be accounted for by alterations from the normal blood supply brought about by some as yet unknown noxious agent or agents.

It is only comparatively recently that Dale has shown how vaso-dilation, the fundamental process of inflammation, is brought about. From the cells directly damaged by any noxious agent, be it trauma or disease, there is first of all liberated histamin, which leads to vaso-dilation of the capillaries with which it comes in contact. At the same time histamin acts as a persistent stimulus to sensory endings in the neighbourhood and the nerve impulses pass through a branching on the nerve fibre going to neighbouring arterioles and there liberate acetyl choline, which brings about vaso-dilation of these vessels of a much more pronounced and prolonged type.

Thus in all inflammatory conditions there is an intervention of definite chemical agents.

In addition to this local axon reflex a direct vaso-dilator effect may follow irritation of sensory nerves at considerable distance from the part showing clinical evidence.

Proof of this is well shown after median neurectomy, performed in the region of the elbow joint, by the marked increase in heat felt in the foot and limb as far up as the knee, which I have noticed continuing as long as two months after operation. This effect is due to the fact that impulses for vaso-dilation are carried by the sensory nerves in a reverse direction—"antidromically"—to the ordinary sensory impulses.

In view of this clinical phenomenon following severance and thus irritation of the median nerve, does it not seem possible that some of the osteo-arthritic lesions distal to some of the sites of marked neuritis in nerve trunks may be secondary to irritation of sensory nerve fibres?

Conclusions

A survey of the clinico-pathological findings of eleven cases of "shivering" and five cases of partial paraplegia ("jinked back") has been made and for the sake of brevity the *post-mortem* findings have been tabulated.

The investigation of the neurological problem associated with shivering, partial paraplegia, stringhalt and grunting has been directed to examination of the peripheral nervous system.

In all the cases surveyed in the tables there has been a widespread condition of osteo-arthritis and a diffuse interstitial peripheral neuritis.

An attempt has been made to co-relate the clinical and pathological observations so as to achieve a rational interpretation of what appears to be a generalised disease of the horse with many local clinical manifestations. The common factor underlying the pathological conditions is a deviation from the normal circulation.

Reference

Dale. *The Lancet*, 1929, 1, pp. 1233, 1285.

Discussion

Mr. R. Craig Robinson, in opening the discussion expressed his thanks to Professor Mitchell for the excellent paper they had had that day, and said that it was the nearest approach they had had to a solution of several afflictions of horses which had troubled them for years. He had not previously understood the connection that "grunting," had with other "diseases," but he had found that "grunters" developed into "roarers" and, therefore, in his opinion, "grunting" was an unsoundness. The only questions he had to ask were—"What is the connection between "grunting" and "shivering"? Also, "What is the cause of these nervous diseases? Is it lack of vitamins or minerals?"

Mr. A. Young said that he had insufficient knowledge to criticise the paper, but, as far as he could see, examiners of horses under the Horse Breeding Act would have to be careful of "grunters" owing to the possibility of future developments. He had wondered if the disease was due to toxins with a microbial origin, or to the presence of other chemical poisons in the blood. It was evident that still further research was required, and, based on Professor Mitchell's work, they were bound to get results.

Mr. O. Stinson observed that they indebted to Professor Mitchell for a paper on what was pioneer work. He had no doubt that the details fitted in to explain what were really symptoms of one central disease and not of several separate diseases. Since hearing of Professor Mitchell's work, he had carried out a large number of *post-mortem* examinations.

Mr. W. T. Hewetson remarked that the paper they had heard that day was worth coming a long distance to hear. He desired to ask (1) What caused the exostoses? (2) What was "jinked back," and (3) How could one differentiate between partial paraplegia after lightning, and the chronic form of the condition?

Mr. N. H. McAlister questioned very much whether the theories would work out, and said that they had extensive evidence, over several years, which showed that heredity must play an extensive part in these diseases. In his experience, he had noted the following points: "Jinked back" was rare in country districts, shivering uncommon in light-legged horses, and stringhalt common to both classes. He did not see how grunting could be connected with stringhalt, and shivering cases. Certain people said they could cure shivering, and some shiverers were very difficult to diagnose. It was essenital, in his opinion, to have extensive *post-mortem* examinations on sound animals before they dismissed the question of heredity.

Professor Mitchell, in reply to the discussion, said that most of the points raised would be answered in the full paper, which would be published, and it was only necessary for him to enlarge on one or two of them. In particular, however, he would reply to the question of heredity raised by Mr. McAlister. He agreed with him that it was quite common to have generations of animals reared on the same farms developing the same diseases, which appeared to point to heredity, but it must be pointed out that these successive generations of animals were usually exposed or subjected to the same set of conditions as regards feeding, light, infections, etc. It was quite possible to explain that point in this manner.

He again thanked them for affording him the opportunity of giving that paper to them that day, especially as he had demonstrated his first case to a previous meeting of the Division. He would ask them to put him in touch with as many cases as possible for *post-mortem*, or make the *post-mortem* examinations themselves.

THE VETERINARY SERVICE ON THE GOLD COAST

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The livestock areas of the Gold Coast consist of the Northern Territories and open plains in the eastern part of the coastal belt. The middle part of the country is forest, where pigs only can be reared.

The veterinary service has its headquarters at Pong-Tamale in the Northern Territories, where there exists a fully-equipped laboratory, a training centre for African assistants and a large stock farm. This station was built in 1930 as the result of the generosity of the Colonial Development Fund. The laboratory produces sera and vaccines, mainly anti-rinderpest, and does routine and research work. The department is responsible for all stock improvement in the colony and the Pong-Tamale farm is the centre of experiment in animal husbandry, from whence large numbers of improved animals are issued and sold to the natives. In passing, it may be of interest to note that there are no settlers nor European-owned farms and all stock is owned by the indigenous Africans. Selection within the breed and judicious crossing with other African breeds have been found most efficient to improve practically horses, cattle and sheep. British pigs, goats and poultry have been imported, thrive well and have improved the local varieties greatly.

During the last two-and-a-half years, an intensive campaign of anti-rinderpest immunisation has been working and most of the cattle are now immune to that disease. Previous to this scheme, rinderpest used to take regular toll of the herds and the cattle population was tending to decline. After the initial immunisation of an area, the young stock are treated annually and the general immunity is thus preserved. Double inoculation with virus and serum, vaccine followed by virulent blood after the negative phase in order to induce permanent immunity, and vaccine followed by double inoculation are used as occasion demands. An immunisation unit consisting of a veterinary officer, several literate African veterinary assistants and from half-a-dozen uniformed cattle guards, is allotted to a certain area, and this unit works at immunisation camps conveniently sited, to which the cattle of the district are brought for inoculation. When the area dealt with by one camp is completed, the unit moves to another camp, and so on. Great care is taken to see that all the cattle

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of particular areas are collected, the onus being on the chiefs and headmen, though the cattle guards assist and control the actual gathering. Field serum and vaccine are used extensively at these camps and each unit is equipped for the manufacture of these commodities. Field serum has been found to be quite as potent and successful as the laboratory product and its preparation is most economical. The Political Administration, chiefs and cattle owners have co-operated enthusiastically in the scheme, which has ended the ever-recurring holocausts of cattle plague. This immunisation work is carried out in the dry season and the beginning of the rains and closes down during the height of the farming season and the harvest. Investigation and treatment of other diseases, such as trypanosomiasis, castration of weed bulls and collection of specimens and material for the laboratory are subsidiary activities of these camps. It is gratifying to find how the success of anti-rinderpest immunisation has brought the department into closer touch with the people, and how it has gained their confidence. At first, the people were doubtful about immunisation, after years of hard but fruitless attempts by the department to control cattle plague by veterinary police methods. Now, in the third year of the scheme, it is evident that all qualms have disappeared and the people are really interested in the department's work and are anxious to co-operate. Chiefs and people from all over the Northern Territories have visited Pong-Tamale voluntarily to see the laboratory and the stock farm. Economic benefit has accrued to the Northern Territories in the preservation and development of the only industry which can bring money into the protectorate. There is a splendid market for cattle in the cocoa areas of Ashanti and the south.

With the eradication of rinderpest, it has been possible to institute a scheme of constructive stock improvement. Using the Pong-Tamale farm as a model and centre, Native Administration farms have been opened for each state under a head chief. Eventually there will be subsidiary farms in each sub-division and a regular chain of effective improvement centres from the main Government farm to the village herd. The head men for these native administration farms are trained at Pong-Tamale for a year and then take charge of the centres. Courses of instruction are also given to young literate Africans from the coast and forest areas to enable them to learn pig and poultry farming and act as foci of improvement in their own localities. Essential in such schemes is a clear idea of what is the improved animal which is the aim of experiment and production. Can an animal worthy of the Smithfield Fat Show or one fit for the dairy class at the Highland be produced or is gradual improvement of the indigenous stock the limitation? The former magnificent animals have taken centuries of hard work to produce, not only in pure animal husbandry, but in pasture, housing, education of the breeder, storing of forage, cropping, and so on. Therefore, as genuine and lasting stock improvement is a slow and gradual process, the obvious limit is the optimum native standard possible and the animal to produce for distribution is one which can live, breed and thrive under such conditions. Further, animals just in advance of this limiting boundary should be bred at such places as this Government farm, in order to forestall the improvement in native conditions, resulting from the progressive educative factors affecting the stock owner, which will lead to a general advance in the standard of living of man and his domestic animals. Thus the present plan of stock improvement, especially of cattle, and also the type of improved animal possible for success, are known to be capable of fulfilment and not mere chimeræ. Most of the buildings and fittings at our farm are home-made and can be imitated by the people. The new Native Administration kraals are exact facsimiles of those at Pong-Tamale, though fashioned of ruder material.

The question of providing fodder for the long dry season is a most important one, and here demonstrations are given in cultivating with ox ploughs, manuring, making hay and silage and the general storing and feeding of cultivated forage.

Apart from epizoötic diseases, such as rinderpest and pleuro-pneumonia, protozoal conditions are the most serious pathological problems. Trypanosomiasis, piroplasmosis, anaplasmosis and theileriasis are all common and require continual research and treatment. A large clearing experiment carried out by the department has evidenced the fact that great areas of the country can be cleared of tsetse-fly, which are species of the riverine palpalis group in most parts of the livestock country. The resistance of our local varieties of livestock, particularly cattle, to these enzoötic protozoal phenomena is remarkable and is the result of very many years' exposure to infection. It is necessary to stress the fact that it is resistance and not immunity, as adverse conditions can and do break down this resistance. Protozoal disease, more than anything else, is a limiting factor in stock improvement by the introduction of exotic animals for breeding. Animal husbandry generally under such conditions is primarily a problem for the protozoologist, as the practical application of genetical improvement must first overcome the local problems of resistance and susceptibility to protozoal disease.

It is an interesting fact that the department is self-supporting, as the money collected in import of livestock tax at the frontier quarantine stations, which are run by our officers, exceeds the annual expenditure. As the local

supply of livestock is not sufficient for the markets of the forest and coastal towns, large numbers of cattle, sheep and goats are imported from French West Africa. All these animals travel by legalised routes and enter the country at approved quarantine stations, where they spend a period of quarantine, to ensure the prevention of ingress of epizoötic disease. These stations are run by African assistants under the supervision of the section veterinary officer.

No doubt it will be of interest to describe shortly the life of the average field veterinary officer. He has his headquarters at the principal administrative centre of his section, where is his permanent house. From there he goes out on tour throughout the section at periodic intervals, in the dry season spending most of his time at his immunisation camps, where he is housed in quite a habitable rest house and can make himself very comfortable. He travels by motor lorry, as there are good dry season roads everywhere and quite a number of permanent all-weather main routes. In the rains, he sometimes travels by horse or bicycle, with his loads transported by head carrier. His work is hard but interesting, sometimes lonely but never dull, and there are endless opportunities for shooting, as game is plentiful but not in such abundance as to make it too easy. Country-bred horses can be bought very cheaply, from about £5 to £8 each. They are not by any means a model type of equine but they are hardy and have surprising stamina. Periodic visits to different stations and an odd month or so among the flesh pots of headquarters at Pong-Tamale provide interludes in a varied existence where the veterinarian finds himself an important and vital member of the official community. The climate of West Africa has a bad reputation, but conditions are much improved, especially housing. By reasonable care and the exercise of average common sense, most people keep wonderfully fit and enjoy the life. The veterinary service has the good fortune to spend its existence in the open country, mainly of the north, where the climate is hot and dry and the abominable stuffy humidity of the coast and forest is lacking. The primitive natives of the stock country are extraordinarily pleasant and amusing people, who are as yet unaffected by all the peculiar complexes and inhibitions of the more sophisticated Europeanised coastal Africans.

I trust this short and probably inadequate account of our activities has yet shown that the veterinary service in the Gold Coast, though a small department, is an important unit in the essential welfare of the colony. In tropical countries where protozoal disease is rampant, the veterinarian is a much more necessary figure in animal husbandry than in temperate climates, where such conditions are absent or few.

Clinical Communications

ENDOCARDITIS IN CATTLE

F. L. GOOCH, F.R.C.V.S.
Stamford

On October 3rd, 1932, I was summoned to attend a cross-bred Hereford cow that had calved during September. The messenger informed me that the cow would not eat anything, had only given a small quantity of milk and was very stiff.

Upon examining the cow I found the pulse intermittent, the temperature normal and the rumen tympanitic. The animal was in a recumbent position, very difficult to get on its feet, and when up was not inclined to move; there was complete loss of rumination. The case was diagnosed as indigestion, with a suspicion that some foreign body might be present in the rumen. A saline aperient was administered and the region of the rumen stimulated externally.

The patient was seen again on the 4th. There was then a good action of the bowels, a large quantity of undigested material was passed, and the pulse and temperature were almost normal. Vegetable tonics were left, to be given morning and evening, and the animal was seen again on the 5th and 7th, when she had apparently quite recovered. She was feeding well, the supply of milk had returned and all stiffness had disappeared: accordingly, she returned to the milking herd. I saw the herdsman several times afterwards and he informed me that the cow was doing well and giving her full complement of milk.

On the 7th of the present month (August) I received an urgent message to say that the same cow was down in the park and unable to rise. On arrival in the early morning, the herdsman informed me that the cow would not come with the others for milking, that she was down, and that he could not move her. I walked down and found that the cow had just died.

This fatality having occurred in a park where the cattle are subject to anthrax, I carefully examined for that but found no signs of the bacilli. I determined to make a complete *post-mortem* and had the carcass removed to the keeper's lodge, where I conducted an autopsy. I found extensive lesions in the endocardium, the mitral valves being completely enveloped with a grapey yellow tissue, resembling the condition found in chronic erysipelas in the pig. All other organs were perfectly healthy, except the glands at the base of the thorax, just in front of the xiphoid appendage of the sternum, which were hypertrophied, two of them being the size of a large duck's egg and of the substance and colour of the spleen. Did this endocarditis start at the time the cow was ill in October, 1932?

During the time that I have been in practice I have seen very few cases of endocarditis in cattle and upon *post-mortem* I have seldom seen the growths on the mitral valve, and as far as I have been able to ascertain not much is to be found in our text-books; at the same time, I have frequently noticed an intermittent heart beat which I cannot always account for, and I have often looked upon it as a premonitory sign of a foreign body interfering traumatically with the heart's action.

I should like to hear the experience of any practitioner who has been able to record similar cases.

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THREE CASES OF POISONING BY PLANTS

J. M. BUCHANAN, M.R.C.V.S.
Stowmarket.

Sometimes in practice one is fortunate enough, in dealing with a case of suspected poisoning by plants, to be able definitely to state the cause of the illness. Usually, however, one is faced with a number of plants all suspicious and a process of elimination does not always clear the mind as to which plant is the actual cause.

The following three cases are typical of these facts. The first two left no doubt as to the causal plant; the third is one of the many which come under the category of doubtful. The former are merely reported here for their comparative rarity; the third case because of its interest.

Case 1.—The subject was an aged sow reported, under the Swine Fever Order, as dead. Two days before she had fed heartily on rhubarb leaves, and thereafter had refused all food. On opening the abdomen, a strong odour of sour rhubarb made its presence evident. The stomach and small bowel were three parts filled with the decaying leaves, and both organs showed an advanced degree of inflammation. It is well known that rhubarb leaves are poisonous to the human subject, but, as far as I am aware, no record is to be found in veterinary literature.

Case 2.—In this case the affected animals were a flock of four goats, belonging to a small-holder, which fed more or less heartily on some rhododendron prunings thrown on the rubbish heap. On examination all of them were off their feed, and the one which had obtained the "lion's share" had been violently sick—the others to a less degree. Castor oil and chlorodyne were given to all four: three made an uneventful recovery; the fourth succumbed the following day.

I merely record this case here because of its comparative rarity, as animals do not usually eat this plant, and not because of any remarkable features.

Case 3.—This case is typical of most cases of suspected plant poisoning in that no fewer than eight recognised poisonous species had been eaten more or less heartily. The symptoms noted were in no degree suggestive of any except *Euonymus europœus.*

The subject was a cart mare to which I was called urgently. She had been grazing, and on being brought in blood was found to be oozing from the nostrils. On my arrival, the owner informed me that the mare was worse, and had been retching in attempts to vomit, and large quantities of froth had been brought up.

On examination, the first thing which attracted my attention was the large quantity of froth coming from the nostrils. The pulse was imperceptible, and micturition and defæcation were absent, in spite of a full colon and bladder (as examination *per rectum* and vagina revealed). When an attempt was made to move the patient, tracheal râles could be heard all over the yard.

No diagnosis was made at this stage. A large dose of morphia and atropin was given hypodermically, and a policy of masterly inactivity was adopted. Later, on paying a second visit, the mare had passed a little fæces and a good deal of greenish fluid had been seen exuding from the mouth and nostrils. Next morning she appeared slightly better and drank a little water, which was immediately returned. She had passed a fair quantity of fæces which contained decomposing plants. She died the same day.

Unfortunately, owing to a slight misunderstanding with the slaughterman, no opportunity occurred for a *post-mortem.* On telephoning the knacker I was informed that the mare's lungs were black, no other lesions being noted.

Samples of the plants on which the mare had fed prior to her illness were sent to the Cambridge Institute of Animal Pathology for identification. They are as follows:—

Eaten in quantity—*Euonymus europœus, Pteris aquilina* (bracken), *Clematis vitalba.*

Eaten in less amount—*Matricaria inodora, Sison amomum, Achillea millefolium* (yarrow), *Chærophyllum temulum, Arum maculatum.*

Appended is the report and opinion of Mr. Wright's Department:—

"Enclosed you will find a list of the names of the plants. The shrub which you say has been largely freshly eaten is *Euonymus europœus.* It is quite possible that this may be the cause of your trouble, but we have not sufficient knowledge as to the symptoms caused by this plant to be in any way certain."

It is interesting to note that a case of plant poisoning occurred at this farm some years ago; the causal plant, however, was not identified.

In conclusion, in spite of the conflicting symptoms and the absence of a *post-mortem,* I am convinced that this was a case of plant poisoning, although unable to "give it a name."

Abstracts

[The Treatment of Azoturia in the Horse. Ritzenthaler. *Schweiz. Archiv. f. Tierhlk,* 1933, Vol. 75, No. 5.]

The author claims successful treatment with calcium therapy of 22 cases of equine hæmoglobinæmia paralytica. His present method is to give 50 grams of calcium gluconate intravenously in a 10 per cent. solution, a suitable heart tonic, 100 grams of sodium bicarbonate by the mouth and a poultice to the loins.

J. E.

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[The Connection between Strangles, Staggers and Jinked Back. Ritzenthaler. *Ibid.*]

The author quotes three case records to illustrate the clinical connection between strangles, staggers (temporary dropsy of the cerebral ventricles) and jinked back. In his opinion, the strangles toxin has a particular affinity for nervous tissue and attacks the brain and spinal cord, with the resultant staggery and dropped back condition. Strains of *Str. equi* vary considerably in their pathogenic affinities and this fact accounts for the wide variations in the syndrome following an attack of strangles.

Strangles, like streptococcal mastitis, is very refractory to vaccination treatment and the assumption of diversity of antigenic structure of the causal organism is well founded.

J. E.

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[Pharmacological Experiments on the Isolated Urinary Bladder of the Dog. Graf, H., and Fröberg, K. *Schweiz. Archiv. f. Tierhlk.* (1933.) Vol. 75, No. 4.]

The authors tested the effects of solutions of drugs applied externally and internally to the isolated bladder of dogs removed immediately after death and set up in a nutrient bath (oxygen-tyrode solution). The muscular activity of the preparations was recorded on a kymograph system connected to the lumen of the bladder. The drug solutions were in some cases added direct to the nutrient fluid and in other cases injected by way of one ureter. The latter method is of direct practical importance with reference to irrigation therapy of the bladder.

When applied internally, arecolin, pilocarpin and eserine stimulated the muscular coat, whilst atropin inhibited it: the above are parasympathetic poisons. Of the sympathetic poisons adrenalin and ergotamin, the former had a stimulant, and the latter an inhibitory action.

J. E.

[Chronic Sub-serous Abscess of the Œsophagus in a Dog. (Trans. title.) Taskin and Gaud. (1933.) *Bull. de l'Acad. Vét. de France.* vi, 4, 167-168.]

The history of this case, which occurred in a six-year-old fox terrier, is as follows. For two years there had been a slight spasmodic cough, increasing in intensity and frequence. There was also slight elevation of temperature. For three weeks there had been vomiting without apparent cause, but generally following the fits of coughing. For one week the dog had been quite unable to retain solid foods, only liquids being tolerated. On examination intense dyspnœa was observed and on percussion of the supero-posterior thoracic region coughing and vomiting were provoked. Lateral radiographic examination showed a strong shadow in the thoracic region corresponding to the lobes of the diaphragm and above and behind the heart. The ingestion of barium milk showed the passage of the opaque liquid between the spine and the shadow. Dorsal radiographic examination showed an oval shadow covering the heart and the cardio-diaphragmatic region, but its lateral limits did not reach the walls of the thorax. The diagnosis given was of a tumour of the mediastinum compressing the œsophagus against the spine. The animal was destroyed and *post-mortem* examination revealed a large sub-serous abscess of the lower wall of the œsophagus between the heart and the diaphragm. The cavity of the abscess was 2 × 1 cm., and there was no trace of a foreign body. The abscess was thick-walled and without communication between its cavity and the œsophageal lumen.

J. S.

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[Spasmodic Contraction of the Stomach in a Dog. (Trans. title.) Taskin and Logelin. (1933.) *Bull. de l'Acad. Vét. de France.* vi, 4, 168-169.]

The subject was a two-year-old cocker, whose appetite and digestive functions and temperature were all normal. However, after even quite moderate exercise the dog would make an intense roaring noise, which increased, and was accompanied by loud liquid râles. If exercise was continued symptoms became increased and were followed by coughing, which ended in a watery vomit, after which the dyspnœa disappeared. A barium meal was given and, on X-ray examination after exercise, contraction of the stomach was seen to force the opaque liquid into the œsophagus, which became dilated for its intra-thoracic extent. Under treatment with belladonna and gardénal this condition, which had lasted three weeks, disappeared in ten days, and a year later there had been no recurrence.

J. S.

[**Anti-Rabic Inoculation of Animals in Morocco in 1932.** (Trans. title.) Remlinger and Bailly. (1933.) *Bull. de l'Acad. Vét. de France.* vi, 3, 115-121.]

The preventive anti-rabic inoculation of dogs and even the vaccination of herbivora after being bitten, have given excellent results in Morocco, with no accidents following their use. Details are given of several cases inoculated with the ether-virus after being bitten. One observation concerned a herd of 50 sows and three boars. These were attacked by dogs and the boars gave fight. One of the boars was bitten and twelve days later developed furious rabies and savaged five pregnant sows and a boar. These received inoculations of the ether-virus on the sixth, seventh and eighth days and the sows farrowed normally a few days later and all survived.

J. S.

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[**On Pig Breeding.** (Trans. title.) Breton. (1933.) *Bull. de l'Acad. Vét. de France.* vi, 3, 125-129.]

The writer quotes calculations showing that the female progeny of one sow might be expected to give birth to 6,434,874 female pigs in ten years, calculated at the rate of three females per farrow and at two farrowings per annum after maturity—provided that all survived, etc.

J. S.

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[**Aujeszky's Disease in Pigs.** (Trans. title.) Remlinger and Bailly. (1933.) *Bull. de l'Acad. Vét. de France.* vi, 4, 169.]

Swine are shown to be susceptible to the American and Hungarian viruses of Aujeszky's disease (infectious bulbar paralysis, or pseudo-rabies). A discussion follows as to whether the disease may be introduced into a free country by therapeutic sera. The writers express their doubts as to the virulence of the blood of swine; moreover, virulence of the blood, when it does exist, lies in the red blood cells, and the serum is without virulence.

J. S.

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[**On the Rôle of Non-susceptible Species in the Dissemination of Coccidiosis.** (Trans. title.) Pérard. (1933.) *Bull. de l'Acad. Vét. de France.* vi, 5, 206-208.]

Reference is made to work by Thomson and Robertson (*Brit. Med. J.*, 1926, p. 282) who showed that oöcysts of *Eimeria sardinæ* and of *E. clupearum*, which live normally in the liver and testicles of herrings and mackerel, can be found unaltered in the stools of men who have ingested parasitised fish. Pérard states that he was pursuing researches of a similar nature in dogs in 1926. Non-segmented öocysts of *Eimeria stiedæ*, from the livers of rabbits affected with coccidiosis, were fed to a dog and were obtained again from the fæces of the dog. The oöcysts were then allowed to segment and fed to a six-weeks-old rabbit which was free from coccidiosis. After three weeks the rabbit was slaughtered and shown to be suffering from coccidiosis of the liver.

J. S.

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Cervical Onchocerciasis of the Dromedary. (Trans. title.) Henry and Masson. (1933.) *Bull. de l'Acad. Vét. de France.* vi, 5, 208-213.]

An account is given of the infestation of dromedaries with *Onchocerca fasciata*, which appears to be of wide geographic distribution though no adequate description of the parasite exists. The parasites were found in thick fibrous nodules the size of an almond. These nodules were situated on the upper and anterior part of the neck and a few could be felt during life.

J. S.

THE INTERNATIONAL ORGANISATION OF CHEMICAL DOCUMENTATION

Questions concerning documentation have of late assumed more and more importance. Scientific and technical documents increase on all sides in such numbers that it becomes more and more difficult to gather useful material for the benefit of inquirers. There are many bodies that deal permanently with the registering, classing and diffusion of such documents. Now the co-ordination of the respective activities of these institutions on an international basis has become necessary in order to permit them to carry on their work efficiently.

As regards the province of chemistry, a step was taken in 1932, in the scientific and technical sphere, by the entry into activity of the International Office of Chemistry, created by international convention, and having its headquarters in Paris.

Its first act was the summoning of a Conference of Experts, the work of which led to the adoption of a certain number of recommendations fixing the three principal tasks of the Office:—

(1) To render accessible to all interested persons the already existing documentation, accumulated in the various centres, depôts and collections.

(2) To guide the chemical documentation which is in course of production, in such a way as to facilitate its registering, filing and diffusion, by methods found to be the best.

(3) To ensure co-ordination between the documentation relative to chemistry and that concerning other scientific knowledge in the field of international documentation.

Thanks to these varied operations, the users of such documentation will find that all over the world a practical and rational organisation of documentation in chemistry is being carried out systematically, and progressively liable to be more and more effectively adapted to their needs.

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Whitefish meal is recommended as a valuable constituent in the food ration for dogs—from one to four ounces according to the age of the dog.

Reports

REPORT OF PROCEEDINGS UNDER THE DISEASES OF ANIMALS ACTS FOR THE YEAR 1932*

In presenting the above report, the Chief Veterinary Officer of the Ministry of Agriculture mentions two events of special importance, *viz.*, (*a*) the institution by Government, through a Committee of the Economic Advisory Council, of an enquiry into diseases of cattle, and the means whereby they can be most successfully combated, and (*b*) Agreements made at the Imperial Economic Conference at Ottawa regarding the importation of Canadian cattle into the United Kingdom, and the importation of pedigree stock from the United Kingdom into Canada.

PART I—POSITION OF GREAT BRITAIN WITH REGARD TO CONTAGIOUS ANIMAL DISEASES

There were 25 outbreaks of foot-and-mouth disease during the year, all of which were in England and Wales, no outbreaks occurring in Scotland. Six hundred and twenty-nine cattle, 1,608 sheep, 416 pigs, and one deer were slaughtered, the compensation for slaughtered animals amounting to £16,521 6s. Point is made that there was delay in reporting suspected existence of the disease, in spite of the repeated warnings that have been broadcast from time to time—a circumstance which means not only the loss of valuable stock, but of thousands of pounds to the public funds, and also to the agriculturalist. Serum treatment was used in eleven outbreaks, and administered to 2,642 animals, comprising 262 cattle, 2,291 sheep, and 122 pigs. In four cases, disease developed, the inference being that infection had been acquired before serum was injected, or after the period of immunity, which does not usually extend for more than ten days, had expired.

Bovine tuberculosis was reported to exist on 22,014 premises, and the number of animals examined by veterinary inspectors was 302,354. Animals to the number of 19,199 were reported as coming within the scope of the Tuberculosis Order of 1925, comprising 12,058 cows in milk, 6,625 other cows and heifers, and 516 other bovines. Of the above, 559 were reported as giving tuberculous milk, 2,995 as suffering from tuberculosis of the udder, 7,214 from tuberculosis emaction, and 8,431 as suffering from chronic cough with clinical signs of tuberculosis.

The number slaughtered was 19,027, which is the highest since 1925. On *post-mortem* examination 0·5 per cent. were found not affected, 32·3 per cent. showed lesions non-advanced, and 67·2 per cent. advanced tuberculosis. £68,814 13s. 8d. was paid in compensation, or an average of £7 17s. for the non-affected, £6 17s. for the non-advanced, and £2 0s. 1d. for the advanced. In salvage, Local Authorities received £14,941 9s., or an average of 15s. 8d. per carcass, the Ministry refunding to Local Authorities 75 per cent. of the gross amount of compensation paid under the Order.

The number of reported outbreaks of swine fever enquired into during the year was 11,576, of which 1,553, or 13·4 per cent., were confirmed after veterinary examination at the Ministry's Laboratory. This was a decrease of 1,923 reported cases and 471 confirmed cases as compared with 1931. Swine numbering 2,297 were slaughtered by the Ministry's inspectors for diagnostic purposes, and compensation paid to owners amounted to £1,520. The aggregate loss in pigs which died or were destroyed on account of swine fever in 1932, amounted to 37 per cent. of the pigs on infected premises. The East and West Ridings of Yorkshire were particularly bad, and it was found necessary to impose special infected area restrictions in these counties.

One thousand five hundred and eighteen cases of swine erysipelas were confirmed during the year, but a satisfactory method of control of this disease is available, and described in the Ministry's Advisory leaflet, No. 17.

Three hundred and sixty-one outbreaks of sheep scab occurred, an increase of 14 on last year. Of these, 118, or 32·7 per cent., were unreported; 54 and 64 of the latter were discovered by local authority staffs, and the Ministry's inspectors respectively. The majority of the outbreaks in England occurred in the North, Cumberland being particularly infected. The position in Wales remained practically unchanged, and in Scotland, the disease has been confined almost entirely to the Outer Hebrides. The lack of proper dipping appliances is one of the chief factors responsible for the continued prevalence in many areas, and the installation of adequate baths has produced a very marked improvement in some districts. As the sheep scab prevalence has been considerably reduced during the past three years, the Ministry of Agriculture, by letter dated October 29th, 1932, asks Local Authorities to consider amendment of their regulations, exempting sheep moved direct from Scotland from their operations, and as Northumberland has had no sheep scab since 1929, to extend exemption to that county.

Three hundred and forty-four outbreaks of anthrax were confirmed, a decrease of 121, or 26 per cent., on last year. Of these, 267 were unconnected with any previous case, and the probable origin of 192 was from the use of imported feeding stuffs.

* Price 1s. 3d., postage extra, obtainable at His Majesty's Stationery Office, or through any bookseller.

The prevalence of parasitic mange in equine animals has continuously declined during the past 14 years. There were 127 outbreaks in 36 counties reported by Local Authorities, as against 138 outbreaks in 39 counties in 1931, the number of horses attacked being 204 in 1932, as against 237 in 1931. Decreases are shown in Essex, Norfolk, Suffolk, and in the Home Counties, but London shows an increase of two outbreaks, Lindsey eight, and Stafford five outbreaks.

PART II—IMPORTATION—GENERAL PREVENTIVE DISEASE MEASURES

The importation of ruminating animals from countries infected with foot-and-mouth disease is entirely prohibited.

During 1932, importations were limited to animals from Ireland, Channel Islands, and the Isle of Man; to store cattle from Canada; to cattle from Canada intended for slaughter at the port of landing; and to animals for exhibition or other exceptional purposes. The imports from the Irish Free State were much reduced below the normal, the numbers being 752,256 cattle, 581,291 sheep, 247,498 swine, and 38 goats, as against 831,963 cattle, 670,336 sheep, 428,178 swine, and 81 goats in 1931. Store cattle to the number of 14,938 were landed at Birkenhead, Glasgow, and Cardiff from Canada in 1932, as compared with 23,064 in 1931. Of these 7,007 were slaughtered in landing place, and 4,786 were licensed out of landing place for slaughter, and 3,145 for further feeding. Under the provisions of the Ottawa Agreement Act, 1932, Canadian cattle of all classes may now be landed at approved landing places in Great Britain after having undergone one day's official veterinary supervision before shipment. They must be marked with a numbered ear tag before shipment, and after landing are subject to the same regulations as to examination and subsequent movement and marketing as Irish cattle.

Of disease in imported animals, 62 cows from the Irish Free State, 21 from Northern Ireland, and three from the Isle of Man were detained for examination suffering from induration of the udder. Six were found to be affected with tuberculosis within the meaning of the Tuberculosis Act of 1925, three with advanced tuberculosis, and three with non-advanced. They were slaughtered and no compensation paid. Seventy-one cases of sheep scab were found in 39 cargoes from Ireland, 27 from Northern Ireland, and 44 from the Irish Free State. Except those slaughtered by owners, they were dipped in the landing place until cured, and all sheep that had been in contact were double dipped, once at the landing place, and again at the place of destination within 14 days of the first dipping.

A new Importation of Meat, etc. (Wrapping Material) Order, 1932, was issued to prevent the use of meat wrappers for the manufacture of bags in which foodstuffs for animals, fertilisers, and horticultural produce are packed and distributed.

Importation of Dogs and Cats.—During the year 845 dogs and 54 cats were imported under ordinary conditions of quarantine, and 105 dogs and four cats were landed under the special quarantine conditions applicable to performing animals; 108 canine animals and 95 feline animals other than the domestic dog and cat were landed under quarantine conditions. The canines included silver black foxes, blue foxes, Japan foxes, and white foxes. No cases of rabies occurred in imported animals during the year. A pilot was fined £25 under the Diseases of Animals Acts and £100 for making a false declaration to the Customs for bringing two dogs from France in an aeroplane. A woman was fined £10 for attempting to smuggle a small dog into the country in a hat-box, and a similar attempt at smuggling in a motor car was punished by a fine of £5.

PART III—PROTECTION OF ANIMALS DURING TRANSIT

The casualties of animals during sea transport were remarkably low. In the Irish trade they amounted to 0·04 per cent. for cattle, 0·02 per cent. for sheep, and 0·13 per cent. for swine; Channel Islands trade 0·06 per cent. for cattle, and the Canadian trade 0·10 for cattle.

Exportation of Horses.—Three thousand eight hundred and forty-seven horses were presented for examination at ports: 3,652 were passed and shipped, the remaining 195 being rejected. Only four casualties were reported among horses shipped to European ports; five occurred in the Irish and coastwise trade, and seven on the ocean routes. The total of live horses exported to the Continent has been reduced from 10,526 in 1928 to 3,652 in 1932.

PART IV—EXPORT OF PEDIGREE AND OTHER STOCK

The Quarantine Station, East India Dock, London, was occupied for 14 quarantine periods during the year, nine of these being for the prescribed duration of not less than 14 days, and five were of three weeks' duration or slightly more. The number of animals entering the station was 331 (148 cattle, 145 sheep, 30 pigs, and eight goats). Thirty-eight cattle, nine sheep and two swine were destined for Australia, and 73 cattle, 186 sheep, five goats, and 13 swine to the Union of South Africa. Canada now accepts cattle, sheep, goats and swine through the Quarantine Station as an alternative to the previous practice of requiring the whole of Great Britain to be free from foot-and-mouth disease restrictions for 60 days. New Zealand still maintains complete prohibition against stock from Great Britain, which has been in operation since 1924.

PART V—INTERNATIONAL VETERINARY BUREAU.—SESSION 1932

Mr. D. A. E. Cabot, M.R.C.V.S., represented the Ministry at the meeting in Paris. Swine fever, the Brucella infections, tuberculosis, contagious bovine mastitis, foot-and-mouth disease, and the disinfection of vehicles were the principal subjects discussed. It was agreed that, on public health grounds, live vaccine used for the control of contagious abortion should be derived from proved abortus strains. A discussion on the possibility of mutation of the types of viruses in foot-and-mouth disease took place, but the general opinion remained that the different types of viruses are fixed.

PART VI—THE VETERINARY LABORATORY

In regard to the various specimens received for diagnosis, 2,876 related to swine fever, and 1,596 proved positive. Of 521 anthrax specimens 390 were positive. Of 77 sheep scab specimens 71 were positive; two specimens of rabies submitted were negative.

Twenty-one thousand eight hundred and seventy-seven doses of anti-abortion "A" vaccine were supplied to veterinary surgeons for inoculation of herds affected with epizoötic abortion. The number of agglutination tests carried out was 1,125.

One thousand two hundred and sixty-six doses of Calmette-Guèrin Vaccine (B C G) against tuberculosis were issued for inoculation of selected herds; 183,470 poultry agglutination tests were conducted; 613,483 doses of fowl-pox vaccine were issued for inoculation of poultry against fowl-pox; and 8,459 doses of vaccine were issued for avian typhoid.

RESEARCH

In regard to research, the Foot-and-Mouth Disease Research Committee continued its operations, the work being supervised by the Director, and the other members of the laboratory staff assisted in it. Further work was undertaken in connection with the occurrence of the virus in the blood, urine and milk, and also with the survival of the different types of the virus outside the animal body. The duration of immunity in recovered animals was further tested, including potency tests of immune sera. Work was continued on the survival of the virus of swine fever in refrigerated and pickled carcasses. Work in relation to the antigenic properties of killed cultures of *Brucella abortus* was instituted and study was made of the development of immunity in lambs towards the parasites associated with verminous gastritis. In poultry diseases, attention was paid to the tuberculin test and eradication of tuberculosis in poultry. A study was commenced on an avian strain of B C G vaccine. J. M.

COUNTY OF MIDDLESEX

Following are extracts from the Annual Report of the County Veterinary Inspector of Middlesex, Captain Sidney Villar, F.R.C.V.S., concerning work under the Milk and Dairies (Consolidation) Act, 1915, and the Milk and Dairies Order, 1926, for the year 1932:—

During the past year (1932) 776 routine visits to registered cowkeepers' premises were made and, in addition, a number of special or repeat visits for carrying out the duties under the above Act and Order.

During this period approximately 20,000 examinations of individual cows, the property of 197 cowkeepers or cowkeeping firms, were carried out.

Apart from, and in addition to, the animals which had been suspected of tuberculosis by their owners and reported to the local veterinary inspectors and dealt with by those officials, 59 milking cows were found during the routine inspections to be affected with tuberculosis. Of these 59 diseased cows, 28 were affected with tuberculosis of their udders and yielding tubercle bacilli in their milk. The tubercle bacilli were found in each case by the clinical examination of udders, confirmed by microscopical examination of the milk; in no case was the discovery made by the inoculation of guinea-pigs or other experimental animals and the tuberculin test was used on only two animals during the year.

The number of cows discovered yielding tubercle bacilli in their milk (28) is a serious increase on the number found in the three previous years, during which routine veterinary inspections have been carried out in the county—this increase is undoubtedly to a great extent due to the very low prices which have prevailed during the year in the wholesale beef trade. It is the custom of dairy farmers in this county to fatten and sell their cows to the butcher, allowing them to go barren after about their sixth calf, or even earlier if they have shown any weakness of the udder, but during the past year the prices fat cows have realised have been so low that owners have been unable to sell them except at a great loss; consequently they have therefore again bred from and used such cows as milkers, so that the percentage of aged cows has increased on many farms—although tuberculosis in cows occurs at any age it is much more prevalent in cows of nine or ten years old and upwards than in younger animals.

It is noteworthy that, except in the advanced stages of tuberculosis of the udder, the milk yielded is not usually altered in its quantity or appearance. A record was kept of the 28 samples in which tubercle bacilli were found, and in only three of these was the appearance of the milk sufficiently altered for the milkman to recognise that it was unfit for human consumption.

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Although an animal with tuberculosis of the udder never recovers, the disease may progress very slowly and the cow will be yielding infected milk for weeks or months before her condition becomes sufficiently bad for the owner or milkman to notice it, and during this long period her milk is disposed of for human consumption. It is in these early stages of tubercle-infected milk that routine veterinary inspection is so valuable—there appears to be no other practicable way in which to stop its sale.

Twenty-five cows were found to have suppuration (abscess) of the udder; 23 had acute inflammation of the udder; 35 were affected with the condition known as "summer mastitis," and 67 had sub-acute inflammation of the udder.

In these serious conditions notices totally prohibiting the sale of the affected animals' milk were served on the owners; also as to four other cows suffering from septic illness following on the birth of calves.

In other cases where the defect of the udders was localised or of a temporary nature, the owners were warned, either personally or by letter, not to sell the milk, and a large number of cautionary letters or notices were so written.

During the summer months "summer mastitis" was unusually prevalent. In addition to the udder trouble, affected cows show marked febrile disturbance. The disease mainly attacks animals which are not in milk but which are approaching parturition, and it is supposed that the causal organism is carried from cow to cow by flies. Cows on 16 farms in the Enfield and Mill Hill districts were affected; cases also occurred in other parts of the county. Several affected animals died and very few of them completely recovered.

Another form of contagious udder disease, "streptococcic mastitis," prevailed on five farms during the year.

As in the case of "summer mastitis," frequent visits were made; the affected cows were kept under personal observation and precautions insisted upon to prevent the spread of the disease to other cows and to ensure that the milk of the affected animals was not sold for human use.

The eruptive disease of the udder and teats known as "cow pox" was not so prevalent as in former years. Although animals were found affected on five farms, in only one outbreak was there a serious spread of the disease; this is probably due to the efforts which have been made in previous years to impress on owners the contagious nature of the disease and the necessity of isolating and disinfecting affected animals.

Contagious abortion has been very prevalent in one large herd. Suggestions were made for the control of the disease and for the disinfection of affected cows.

Nineteen animals were seen to be suffering from Johne's disease—slaughter of these animals was advised and it is believed that in each case this was carried out.

Four cows affected with actinomycosis of the tongue were seen; they were all under veterinary treatment and three of them recovered.

N.V.M.A. Divisional Reports

LANCASHIRE V.M.A.*

SUMMER MEETING DEMONSTRATIONS

The Annual Summer Meeting of this Division was held at Ironbridge, and the Duke of Westminster's Home Farm, Aldford, Chester, on Wednesday, June 25th, 1933.

The chair was occupied by the President, Mr. T. Wilson, M.R.C.V.S., and the following members and visitors were present: Messrs. R. Hopps, H. R. Hewetson, R. S. White, H. Sumner, Junr., J. W. Procter, F. H. Leech, C. F. Shawcross, G. O. Davies, J. Holroyd, E. Greenway, J. Storrar, G. Mayall, A. H. Leyland, W. Fowle, Professor S. H. Gaiger, W. Woods, G. H. Locke, R. C. Locke, J. Spruell, H. Burrow, E. H. Curbishley, P. T. Lindsay, G. C. Webster, J. C. Naylor, H. S. Caldwell, F. G. Edwards, A. L. Bragg, R. M. Lee, A. B. Kerr, H. H. Aldred, C. Hargreaves, G. McGhee, R. Finch, H. Davies, J. Birtwistle, A. W. Noel Pillers, A. L. Mullen, R. Hudson (Retford), C. W. Cartwright (Dyserth), C. F. Parsons (Cheltenham), L. W. Wynn-Lloyd (Deganwy), G. H. Pollock (York), L. A. Auchterlonie (Nottingham), R. W. Glaister (Barrow-in-Furness), D. M. Storrar (Prestatyn), T. Hughes (Mold). Apologies for unavoidable absence were received from Messrs. A. Dobie, J. H. Wright, R. Hughes, C. T. Trevers, H. T. Matthews, H. G. Hewetson, J. H. White, H. Holroyd, and C. W. Pembrey.

Members assembled at the Dee Steamboat Co., Landing Stage, Chester, and proceeded by river steamer to Ironbridge, where luncheon was provided by the Association at the Ironbridge Restaurant. At the conclusion of lunch a short business meeting was held.

As the minutes of the last general meeting had been published in the *Veterinary Record*, it was unanimously resolved that they be taken as read.

The Hon. Secretary read correspondence from the President of the Southern Counties Veterinary Society in connection with the resolution passed by that Society in reply to the N.V.M.A. letter concerning the Report of the Reorganisation Com-

* Received for publication, August 16th.

mission for Milk. It was resolved that this letter be considered at the next general meeting.*

A letter from Mr. E. H. Curbishley, on the subject of post-graduate courses for practitioners, was referred to Council.

The President proposed a vote of condolence to the relatives of the late Mr. A. M. Michaelis, of Stockport, an Honorary Associate of the Lancashire Division. The members showed their respect and sympathy in the usual way.

Consideration was given to a recommendation from Council that the Lancashire Veterinary Medical Association endorse the action of the Liverpool Sub-committee for free treatment of sick animals of the poor in approxing of the new site chosen by the R.S.P.C.A., for a hospital and clinic in Breck Road, Liverpool, for the treatment of poor people's animals in accordance with the N.V.M.A. centralised scheme.

Professor Gaiger requested that, in the event of the motion being voted upon, the Hon. Secretary be instructed to make a note of those members voting against the motion. It was proposed by Mr. R. S. White, seconded by Mr. A. W. Noel Pillers, and agreed by a majority that the motion be formally approved and adopted. Professor S. H. Gaiger and Mr. G. O. Davies registered their votes against the motion.

There being no other business, the President concluded the meeting.

. . . . .

The members and visitors proceeded to the Duke of Westminster's Home Farm, where the following demonstrations were given:—

DEMONSTRATION OF PATHOLOGICAL SPECIMENS

(Mr. G. O. Davies, m.v.sc., m.r.c.v.s., d.v.h., Liverpool)

In the course of this demonstration, the following observations were made by Mr. Davies:—

Under pressure from the Hon. Secretary, I have brought along a few specimens which I thought might interest you. I shall just say a word or two about each in turn, and leave you to examine them at your leisure.

(*a*) *Psammoma in the Brain of a Horse.*—Although these tumours are by no means rare, they are not so frequently encountered now that horses are becoming scarcer. The brain in this specimen has been cut longitudinally between the two cerebral hemispheres in order to show the tumour in position in the left lateral ventricle. In some instances, they may be present in both ventricles. Psammomata are benign, and, unless of a large size, do not give rise to symptoms. In this particular case, I understand from Mr. Holroyd, who very kindly sent the specimen, that whilst under his observation the horse apparently recovered and showed few or no symptoms of brain trouble.

(*b*) This is a piece of muscle from a case of azoturia in a horse, and it illustrates the typical type of change which takes place in affected muscles. The muscles become pale and friable, and have been likened to fish muscle. Recent work on this condition has revealed that the name hæmoglobinuria is really a misnomer; it should be called myoglobinuria, as the pigment present in the urine is muscle and not blood pigment.

(*c*) The next two specimens illustrate the typical lesions found in blackhead in turkeys, a disease which seems to be prevalent in this district, and which is responsible for considerable losses in young turkeys. The causal agent is a protozoan parasite *Histomonas meleagridis.*

The liver shows well-defined, yellowish, necrotic foci which are present on the surface and in the substance of the organ. The cæca (occasionally only one is affected) are unevenly distended with inflammatory exudate, have thickened walls, and are sometimes ulcerated.

The majority of affected birds show one or both of these lesions, but in acute cases there may be little to be seen other than a dull-grey exudate in the cæca.

It is stated that blackhead infection is associated with *Heterakis gallinæ* infestation. This is the common pin worm found in the cæca, and it is supposed to be the intermediate host of the parasite.

(*d*) This specimen illustrates the nature of the lesion in tuberculous metritis in cattle, a condition which is by no means uncommon. There is little doubt that such forms of metritis are responsible for cases of sterility which are attributed to other causes. Although cases of this nature may result from generalised blood infection there is little doubt that a number of such conditions arise by direct extension of infection along the Fallopian tubes from the peritoneal cavity. A similar case which was received recently revealed definite microscopic lesions along the wall of the oviduct, although to the naked eye, there was nothing evident which would indicate the presence of infection.

(*e*) You are all familiar with the lesions associated with chronic swine fever. This museum jar contains a collection of lesions from an acute case. Probably the most characteristic lesion is the turkey's egg kidney, the appearance being produced by the presence of numerous punctiform hæmorrhages on the surface and in the cortical substance of the kidney tissue. The appearance of the lymphatic glands, which are swollen and congested, is also characteristic, the congestion being more prominent in the cortex. There is also included in the jar a portion of

* In this connection, the attention of our readers is directed to a letter from the General Secretary, N.V.M.A., published in our correspondence columns.—Ed., *V.R.*

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large intestine, showing punctiform hæmorrhages on the mucosa.

There was wide comment on the excellent preparation of the specimens, and great interest was shown in Mr. Davies' remarks in connection with each. The members availed themselves of the opportunity to inspect the specimens and discuss the subjects with Mr. Davies.

DEMONSTRATION OF EQUINE CASTRATION

R. Hudson, f.r.c.v.s., Retford)

Mr. R. Hudson (Retford) kindly promised to demonstrate the technique of the operation for umbilical hernia, but was unable to do so owing to the unsuitability of the patient for immediate operation. With the kind permission of Mr. J. Storrar, of Chester, Mr. Hudson consented to demonstrate the technique of equine castration by means of the emasculator and local anæsthesia. The operation was eagerly followed by the members, and tributes were paid to the skill and manner in which the demonstration was carried out.

DEMONSTRATION IN THE USE OF THE OPHTHALMOSCOPE

(Mr. A. W. Noel Pillers, f.r.c.v.s., d.v.s.m., Liverpool)

Mr. Pillers prefaced his remarks and practical demonstration by exhibiting coloured charts of the normal pictures of the fundus of the eye in the domesticated animals.

Mr. Pillers then demonstrated the practical use of the instrument on a subject in a darkened loose-box, the members proceeding to avail themselves of the opportunity in small groups at a time.

The subject was prepared by instilling into the eye two or three drops of atropine sulphate solution, 40 minutes before inspection.

The following is a résumé of the points enlarged upon by the demonstrator:—

The purpose of this demonstration is to show the normal picture of the fundus of the eye.

It is well known that a great deal of information can be obtained from an ordinary clinical examination of the eye and its appendages.

1. The conjunctival sac furnishes valuable features with regard to anæmia, fever, œdema, jaundice, purpura, and several other conditions.

2. The discharge from the conjunctival sac is also of value in numerous conditions, such as the tuberculin test, glanders, etc.

3. Then there are the lids, the nictitating membrane, the globe itself.

4. Direction of vision (squint), movements (chloroform narcosis) and retraction (tetanus).

5. The condition of the cornea may be indicative of good health and several diseased conditions.

Notes.

Direct illumination, orthoscope.
Reflected light, ophthalmoscope.
Tapetum lucidum—blue and green.
Tapetum nigrum.
Papilla—white or pinkish.
Close up; up to see down, down to see up.

Lucidum.

Yellow.
Yellowish Green.
Green.
Yellowish Blue.
Blue.
} Mirror.

Nigrum.—Retina and Choroid. Alters a little on pressure.

Papillæ.—A little to the temporal side. Reddish to pink.

(*a*) Peripheral zone. Whiteish.
(*b*) Intermediate zone. Red.
(*c*) Central zone. Yellowish White.

Sclerotic Ring:—
Blue Yellow.
Grey Blue.
Sky Blue.

Retinal Vessels. Horses, from Periphery. No distinction artery or veins.

OPERATION FOR CHRONIC OTORRHŒA IN THE DOG

(Mr. R. S. White, m.r.c.v.s., Liverpool.)

Great interest was roused by this demonstration, and in a carefully arranged and well-chosen setting, Mr. White gave a skilful demonstration of the operation for chronic otorrhœa in the dog (Formston and McCunn). Mr. White, in the course of his demonstration, gave an account of the operation, and freely discussed with the spectators points in connection therewith.

The demonstration proceedings terminated in votes of thanks to the operators and demonstrators, and to all connected with the arrangements for the meeting.

The members returned to Ironbridge for tea, at the conclusion of which Mr. F. G. Edwards, f.r.c.v.s., of Chester, conducted a party to the Eaton Hall Stud Farm, to demonstrate an interesting case of heart disease in a valuable thoroughbred mare, the property of His Grace the Duke of Westminster.

Facilities were available for transport by road and river steamer, and many availed themselves of the opportunity of experiencing the delightful hour's sail on the River Dee.

A. L. Mullen, *Hon. Secretary.*

The number of animals slaughtered in the South American frigorificos in the six months ended June, compared with the corresponding period last year, were: Cattle, 2,086,299, against 1,988,211; sheep, 2,709,771, as against 2,464,992; and pigs, 542,140, compared with 372,113.

DUMFRIES AND GALLOWAY DIVISION*

MEETING AT CARLISLE

A meeting of the above Division was held at The Crown and Mitre Hotel, Carlisle, on April 4th, 1933.

The President, Mr. John Allan (Castle Douglas), occupied the chair, and the following members were also present: Miss Burnett, Messrs. J. Bell, J. Cameron, W. T. Hewetson, N. McAlister, R. Craig Robinson, W. Robinson, J. Ritchie, J. Reid, G. A. Sangster, R. Simpson, O. Stinson, A. Young, and F. A. Davidson, Honorary Secretary. Professor W. M. Mitchell and Mr. J. N. Ritchie, Edinburgh, were present as visitors.

Apologies for absence were received from Messrs. F. Croudace and A. J. Kennedy.

Election of Member.—Mr. W. G. Robinson, Carlisle, nominated at the last meeting, was elected on the motion of the President, seconded by Mr. R. Simpson.

Correspondence.—(1) *The Scottish Committee on Contagious Bovine Abortion*: The Secretary stated that he had forwarded the resolutions adopted at the last meeting to the Secretary of the Scottish Branch, and read replies stating that the Branch had approached the Secretary of the Abortion Committee, suggesting that there should be a fuller representation of general practitioners on their Committee. The members present were quite satisfied with the action of the Branch, and it was later proposed that, should the Abortion Committee agree to this recommendation, the name of Mr. A. Young, Dumfries, be forwarded to the Branch as the representative of the Dumfries and Galloway Division.

(2) *Treatment of Animals of Poor Persons*: The Secretary read further correspondence with the Divisional Organiser of the R.S.P.C.A. with reference to the proposed Decentralised Scheme for the Treatment of Animals of Poor Persons, and stated that the R.S.P.C.A. were agreeable to the amendments proposed by the Division at their last meeting. Mr. R. Simpson, seconded by Mr. O. Stinson, proposed that the Secretary proceed on the lines suggested, and arrange a meeting with the Local Secretaries of the R.S.P.C.A., before the Annual General Meeting at Dumfries in November, 1933.

(3) *Election of President of the Scottish Branch N.V.M.A.*—Correspondence was read from the Secretary of the Branch with reference to the system of electing the President of the Branch. After some discussion it was recommended unanimously, on the motion of Mr. R. Simpson, seconded by Mr. G. A. Sangster, that "The Branch President be nominated by the Scottish Divisions, in rotation, but that the nominee need not be the President of the Division at the time of nomination."

Representative to the Executive Committee of the Branch.—The Secretary pointed out that at present he was the only representative to the Executive Committee of the Scottish Branch, and when unable to attend the Meetings, it was unfortunate that no other member from the Division could deputise; he therefore suggested that this position should be changed. After discussion, it was proposed by Mr. R. Simpson, seconded by Mr. Young, that "The representative of the Dumfries and Galloway Division to the Executive Committee of the Scottish Branch be the Secretary or, if he is unable to attend a meeting, the nominee of the President."

R.C.V.S. Council Election.—The President pointed out that Mr. R. Simpson's term of office on the Council of the R.C.V.S. terminated this year, but that he had allowed his name to go forward for re-election. He said that they had all been more than satisfied with Mr. Simpson as a member of the Council, and he had no doubt that it would be agreed unanimously to give Mr. Simpson their full support when the elections took place. He would also propose that the Secretary be instructed to circularise the members of the profession in the area of the Division and place Mr. Simpson's candidature before the Scottish Branch Meeting that week.

Mr. McAlister, in seconding the President's motion, said that it was very satisfactory that they had had a representative of the Division on the Council of the R.C.V.S. during the past three years, and he agreed with the President when he said that the Division was very fortunate in finding Mr. Simpson a willing candidate.

The President's motion was agreed to unanimously.

Next Meeting.—It was decided to hold the Summer (Social) Meeting at Castle Douglas, on a Thursday, towards the beginning of July.

Paper.—The President, at the close of the business meeting, said that there was no need for him to introduce the author of the paper that day, as Professor Mitchell had always been very willing to attend their meetings. Some years ago, Professor Mitchell had given a demonstration at a meeting of the Division, and showed them a *post-mortem* specimen taken from a horse, which ultimately led him to conduct a very careful inquiry into the diseases which were the subject of the paper. He was sure that the members would all be very gateful that he had returned to announce the results of his investigations to them, as there was no doubt that they would find that they had been carried out in the careful and conscientious manner characteristic of Professor Mitchell. He had great pleasure in asking Professor Mitchell to give his paper on "Some Aspects of the General Osteo-Arthritic Problem in the Horse."

* Received for publication, August 11th.

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[This paper is reproduced, together with a summary of the discussion, at the commencement of this issue.—Ed.]

Vote of Thanks.—At the conclusion of the paper and discussion the President said that he had no doubt that was one of the most interesting papers which had ever been presented to that Division. Not only was it an outstanding advance on anything they had ever heard on this subject, but they all realised the tremendous amount of time and work that had been spent in reaching the very advanced stage that Professor Mitchell had done. It was almost impossible to criticise the paper because it was based, not on theory, but on actual facts, which did not allow of contradiction, and it gave him great pleasure to ask the members to accord the essayist a very hearty vote of thanks. The meeting responded enthusiastically.

F. A. Davidson, *Hon. Secretary.*

THE BRITISH ASSOCIATION

SUMMARIES OF PAPERS

(*Concluded*)

Milk Production and Distribution in Relation to Nutrition and Disease

Professor T. J. Mackie, opening a discussion on this subject by the Section of Agriculture, speaking of the milk supplies of the country in relation to public health, referred to milk as a vehicle of infection and to the hygienic problem. The problem, he said, still awaited an effective and practical solution. An abundant supply of safe and clean milk was one of the primary requirements of the community. At the same time, the consumption of milk per head of the population was comparatively low, compared with the consumption in other countries. It must be admitted that cleanliness and safety were not qualities which appertained to our milk at the present time. It was difficult for the medical profession to popularise a more general use of milk until the standard had been raised. Ordinary raw milk was a constant menace to the public health, and the effective combating of this menace was lamentably overdue.

Bacteriologically speaking, milk was often the most impure food of which we could partake. He emphasised the need for scrupulous cleanliness and intelligence in dairying methods, and said that it was encouraging at the present time to find that the large milk distributing agencies were now utilising scientific methods more and more for the control of their product. He advocated an even more effective control, exercised on behalf of the public, by public authorities. Immediate complete eradication of bovine tuberculosis he considered impracticable. Eradication must proceed slowly. There was not much inducement for the individual farmer to clear his herd in face of the extra expenditure involved. In the public health interest alone the Government might justifiably supply the initial stimulus towards the eradication of bovine tuberculosis. In any case, for a considerable time to come, tuberculous milk, so-called, would be used, and must of necessity be used, and the only immediate remedy was artificial disinfection.

In view of the facts of milk-borne tuberculosis, only two types of milk were justifiably saleable to the public—that from cows which reacted negatively to the tuberculin test and that pasteurised by effective methods under proper control. Where it was possible to supply these products the sale of ordinary raw milk should be forbidden. In other districts it should be sold only under a special designation, so that the consumer himself could take steps towards sterilisation. They were sometimes told that a public declaration of the facts might create a general alarm with serious economic commercial results with regard to the total milk consumption. But perhaps it might require in the end a serious public alarm before the necessary prophylactic measures were begun.

Compulsory Pasteurisation

Dr. Norman C. Wright, dealing with some implications of compulsory pasteurisation, said that it appeared that the natural outlet for the long-established producer-retailer was the sale of high-grade tuberculin-tested milk. Compulsory pasteurisation might well provide him with a relatively stable, if not exclusive, market for his milk. With regard to the small dealer, compulsory pasteurisation would probably make it extremely difficult for him to continue in business. The argument that pasteurisation would discourage clean milk production was based on the erroneous impression that pasteurisation would mask the inherent defects of milk produced under dirty conditions. Reports received from cities in which compulsory pasteurisation had been in force for some years showed that the hygienic methods of handling milk at the farm had shown a definite improvement since processing became obligatory. In any event, any retrograde tendency could be prevented by the inclusion of a suitable pre-pasteurisation bacterial standard, a course which had been adopted with success in nearly 500 American cities. Even if the voluntary growth of tuberculin-tested herds in Great Britain under the Milk (Special Designations) Order was maintained at its present rate, it would take over 400 years to reach the American standard of freedom from tuberculous infection.

A Record of Disease

Dr. G. S. Wilson, Professor of Bacteriology as applied to Hygiene, London School of Hygiene and Tropical Medicine, said that in the last 20 years at least 10,000 cases of scarlet fever, septic sore throat, diphtheria, enteric fever, dysentery, and gastro-enteritis were traceable to milk-borne infection, while 100,000 persons had developed tuberculosis as the result directly or indirectly of drinking tuberculous milk. In the last few years a fresh disease, undulant fever, which in this country appeared to be largely milk-borne, had been recognised, and there were reasons for believing that about 500 cases of this disease occurred annually in England and Wales. The position with regard to milk at the present time was very unsatisfactory, and no doctor aware of the facts could with a clear conscience recommend the free consumption of raw milk. Not until milk was produced under hygienic conditions, and subsequently exposed to adequate heat treatment, could the medical profession feel morally justified in recommending its unrestricted use. They must demand clean milk rendered safe by pasteurisation.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

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DIARY OF EVENTS

Sept. 25th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

Sept. 25th-26th.—R.C.V.S. Jubilee Memorial and Bursary Prize Examination.

Oct. 4th.—R.C.V.S. Committee Meetings.

Oct. 5th.—R.C.V.S. Registration Committee.

Oct. 6th.—R.C.V.S. Committee and Council Meetings.

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PERSONAL

Marriages.—Pugh, D. E.—Spring, D. M. On September 12th, at St. Gabriel's Church, Swansea, Mr. David Ernest Pugh, M.R.C.V.S., son of Mr. and Mrs. N. W. Pugh, Cefn Draw, Three Crosses, Swansea, to Miss Dulcie Monica Spring, younger daughter of Mrs. J. M. Spring and the late Mr. Spring, of Beechwood Road, Uplands, Swansea, and granddaughter of the late Alderman W. H. Spring, the Rev. M. H. L. Williams officiating.

The bridegroom's brother, Mr. Gwilym Pugh, was best man, the groomsmen being Mr. Kenneth Spring and Mr. Christopher Pugh, M.R.C.V.S.

After the ceremony a large number of guests attended a reception at the Metropole Hotel. The honeymoon is being spent in the Channel Islands.

Stewart-Walker. On September 15th, 1933, at St. Katharine's Church, Ickleford, Hitchin, by the Rev. J. T. Wyatt, M.A., Rector of Ickleford, assisted by the Rev. David A. Murdoch, B.D., Newton-on-Ayr Old Church, Ayr (brother-in-law of the bridegroom), William Lyle, eldest son of the late Mr. and Mrs. W. W. Stewart, Waverley Park, Shawlands, Glasgow, to Ethel Marian, younger daughter of Mr. and Mrs. T. G. Walker, of Ramerwick Manor, Hitchin, and formerly of Symonds Hyde, Hertfordshire.

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International Veterinary Congress.—We desire to make it clearer than was done in our report of the meeting of the Permanent Commission (published in our last issue), that the Italians, as they had done in London, asked that Italian might become an official language. Moreover, M. Stang's suggestion in regard to the use of Italian, was that Italians presenting papers might be permitted to speak to the discussions in Italian—the suggestion was not that Italians generally should speak in their own language. It should also be noted that M. Leclainche proposed that Mexico should be accepted as a member of the Congress, and this proposition was agreed upon.

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UNREGISTERED PRACTITIONER FINED IN VICTORIA

An Australian paper records the successful prosecution, under the Veterinary Surgeons' Act, of Cecil E. Bailey, of 14, Auburn Grove, Auburn, who was charged with having acted as a veterinary surgeon at Auburn on or about July 7th, 1933, not being a registered surgeon within the meaning of the Act.

Detective Lyon said that a Mr. Chapman, whose wife owned the racehorse Royal Hermes, had engaged Bailey to attend to the horse for a sore back. On the evening of July 7th, after the horse had been given the evening meal, Chapman found the horse was ill. Bailey was sent for, and gave the horse treatment which should not have been given. When questioned, Bailey admitted that he was not registered in Victoria.

Walter O. C. Chapman, civil engineer, of Auburn Grove, Auburn, said that Bailey, who had represented himself as a fully qualified veterinary surgeon, stated that the horse had been poisoned with arsenic. Bailey put his hand down the horse's throat, gave it a drench, and bled it from the front legs. The racehorse was valued at 300 guineas.

Constable Campbell said when Bailey was questioned he admitted he was not registered in Victoria, but stated that he was registered in London. Asked if he treated the horse, Bailey said it was the worst case of poisoning he had attended.

Robert N. Johnson, Registrar of Veterinary Surgeons, said that Bailey was not registered in Victoria, and had never made application for registration. A drench such as that administered would be useless for arsenic poisoning. The board viewed the case seriously. Bailey's name did not appear on the London register.

The presiding magistrate said that it was a most serious case, and that the Bench had decided to inflict a fine which would be a lesson to others.

Bailey was fined £40; in default, distress.

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SETTLEMENT IN N. AUSTRALIA: TICK-RESISTANT CATTLE NEEDED

A contributor to an Australian paper, urging the possibility of settlement in the north, states that cattle have not been a success in the coastal area of the north chiefly owing to the tick and the buffalo fly and lack of resistance against these in the British breeds of cattle.

"Brahmin cattle were tick and fly resistant but would not readily cross with British breeds, were small and on open range became as wild as deer. I believe with the use of Zebu cattle the coastal area could supply the world with baby beef. In fact, I consider experiments should be carried out on a commercial scale with cross-bred Zebu cattle, together with experiments with paspalum and Rhodes grass and a close study of the native grasses. Even the despised spear grass that grows during the wet season to eight and ten feet high, if cut at the right stage, I believe, would make a nutritious stock ensilage for the dry season.

"After seeing what has been accomplished by the pioneers in the hill country of Gippsland—to my mind one of the finest feats of land settlement the world has ever seen or will see—I feel that the north, with a little experimental work and a little guidance, would soon be an asset instead of a problem."

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FEWER LOST DOGS IN LONDON

Tenders recently invited by the Receiver for the Metropolitan Police District for the collection, maintenance, and disposal of stray dogs call attention to a much appreciated duty performed by the police.

It is stated that the latest figures show a striking decrease in the number of lost dogs in London. In the London County Council area in 1930 no fewer that 19,303 dogs were found straying by the police, compared with 16,474 in 1931. Last year the number had further decreased to 14,342.

The method adopted by the police is to take into "custody" any dog without a collar or on

whose collar is a name and address indicating that it is some distance away from its home. At present the work of collection from local police stations is undertaken by the Battersea Dogs Home, Our Dumb Friends' League, and a contractor in East London. They have specially equipped vans to transport the animals, and these are kept for a reasonable time, after which they are either sold or otherwise disposed of. In the case of obviously valuable dogs, however, the police are authorised to circulate descriptions, so that their owners have every opportunity of claiming them.

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DOG NUISANCE PREVENTATIVE

It is stated in a recent issue of the *Pharmaceutical Journal*, that the value of the application submitted seems to be based on the powerful odour of certain volatile oils. It consists chiefly of oil of citronelle, and may possibly contain some Turkish geranium oil, sometimes known as Palmasosa oil. Some fixed oil is present, though this may have been introduced as an adulterant in one of the volatile oils; but the presence of a fixed oil such as olive oil or liquid paraffin, would result in a more persistent odour. A mixture of two volumes of oil of citronelle, one of palmasosa oil and one of olive oil, would probably have the same effect.

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POULTRY CENSUS: INCREASES IN ALL SECTIONS

The figures of the poultry census which was taken by the Ministry of Agriculture on June 3rd, on holdings exceeding one acre in extent in England and Wales, show increases in all classes of stock.

It was anticipated, on account of the low prices for eggs and poultry during the last two seasons, that the progress of recent years would be checked, but an increase of 3,416,000 fowls, or 6 per cent., over the previous year brings the total number to 61,163,000, of which 33,731,000 were under six months on June 3rd. Last year there was an increase of 5,170,000, or 10 per cent., over 1931. Ducks were more numerous by 45,000, or 2 per cent., the increase being due to a larger proportion of young ducks. Geese showed an increase of 88,000, or 15 per cent., whereas last year the increase over 1931 was only 22,000, or 4 per cent.

The most surprising development was in turkeys, which have increased in one year by 258,000, or 47 per cent., and have reached a total of 811,000 for the whole country, which is by far the largest number during the last eleven years. Norfolk is the largest turkey rearing county in England, with a total of 95,000, while Suffolk has 56,000.

A preliminary review of the counties shows that Lancashire easily retains her position as the premier poultry raising county, having a total of 7,463,000 fowls, which is equal to 14 per cent. of the total in England and Wales. The three Ridings of Yorkshire have 6,461,000 fowls, while the three Divisions of Lincoln have 3,023,000, and Essex, Devon, Kent, Norfolk and Suffolk all exceed 2,000,000.

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At the recent Conference of the Sanitary Inspectors' Association a resolution was passed urging the Ministry to consider making a definite pronouncement on the desirability or otherwise of the application of heat to the general milk supply before it reached the consumer.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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REPORT OF THE REORGANISATION COMMISSION FOR MILK

To the Editor of the Veterinary Record

Sir,—My attention has been drawn to the report of the Summer Meeting of the Lancashire Division, appearing in this issue, in which reference is made to the receipt of correspondence from the President of the Southern Counties Veterinary Society in connection with the resolution passed by that Society in reply to the N.V.M.A. letter concerning the Report of the Reorganisation Commission for Milk.

I note that this correspondence is to be considered at the next General Meeting of the Lancashire Division and I feel that it would be helpful to that gathering to be in possession of the terms of the letter addressed by this Association to the Hon. Secretary of the Southern Counties Division following upon the consideration of the aforesaid resolution at the July meeting of the Council of the Association. This letter was as follows:—

July 12th, 1933.

J. B. White, Esq., M.R.C.V.S.,
Hon. Secretary,
Southern Counties Division, N.V.M.A.,
39, Castle Street, Salisbury.

"Dear Sir,—I laid the resolution in reference to the Reorganisation Commission for Milk, passed by your Division on May 26th, before the Council of the N.V.M.A. at a meeting held on July 4th.

"I am to reply that no request for its views was received by this Association from the Reorganisation Commission for Milk. As will be observed from their terms of appointment, the Commission were instructed to prepare, in accordance with the provisions of the Agricultural Marketing Act, 1931, a scheme or schemes for regulating the *marketing* of milk, and it could not be foreseen that the scope of their inquiries and recommendations would extend to the veterinary inspection of dairy cattle. Had there been the slightest hint that the Commission were considering questions directly affecting members of the veterinary profession, the Council would undoubtedly have offered to obtain and present the views of its members.

"The position which has arisen in consequence of the failure of the Commission to avail themselves of the valuable veterinary evidence which this Association could have supplied is, of course, as much a matter of regret to the Council of the N.V.M.A. as it is to the members of your Division."

. . . . .

I am, Sir,
Yours faithfully,
F. Knight,
General Secretary.

2, Verulam Buildings,
Gray's Inn,
London, W.C.1.
September 20th, 1933.